

Atlantic Richfield Company

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Anthony R. Brown
Project Manager, Mining

July 19, 2017

Lynda Deschambault
Remedial Project Manager, Superfund Division
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, 10th Floor (SFD 7-1)
San Francisco, California 94105

Subject: Supplemental 2017 Soil Sampling for Soil pH in Revegetation Plots
Leviathan Mine Site
Alpine County, California

Dear Ms. Deschambault:

Atlantic Richfield Company (Atlantic Richfield) has prepared this letter to inform U.S. EPA of supplemental soil sampling activities for the 2017 field season associated with the Focused Feasibility Study Revegetation Treatability Study Work Plan at Leviathan Mine Site (site) in Alpine County, California. The Revegetation Treatability Study (RTS) is being implemented in partial fulfillment of the requirements of the U.S. Environmental Protection Agency Region 9 (U.S. EPA) Statement of Work attached to the Administrative Order for Remedial Investigation and Feasibility Study (Unilateral Administrative Order), Comprehensive Environmental Response, Compensation, and Liability Act Docket No. 2008-18 issued on June 23, 2008.

The RTS work plan was conditionally approved on July 7, 2016 by U.S. EPA and finalized on September 9, 2016. Atlantic Richfield completed a portion of the scope of work outlined in the RTS work plan during the 2016 field season. In 2016, three revegetation plots and three hydrology plots were delineated and pre-implementation soil samples collected at the beginning of the study. Revegetation plot locations are shown on Figures 1-4. The revegetation plots were subsequently treated with soil amendments based on the initial soil sampling results. Lime, organic matter, and fertilizer were incorporated to a nominal depth of approximately three feet below ground surface (bgs) to support plant growth and survival. Additional soil samples were collected from the revegetation plots after amendment incorporation and prior to seeding.

The addition of lime was intended to increase the soil pH to a desirable level for plant growth. Based on the characteristics of the liming product, it may take multiple months for the lime to fully react in the soil and alter soil pH. Since soil sampling was conducted only days after the amendment incorporation, the longer-term effects of the liming agent on soil pH are yet to be determined.

ADDITIONAL SOIL SAMPLING FOR 2017

Considering the long-term reactivity of liming agents, additional soil sampling will be conducted during the 2017 field season to provide additional data to aid in our understanding of the effectiveness of the liming agent to alter the soil pH and the effectiveness of the mixing techniques employed.



The original work plan did not include sampling in 2017. However, an interim sampling is planned to provide additional information that will assist in evaluating and refining performance monitoring during the 2017 field season and provide an intermediate reference for pH changes with depth over the course of the study. Soil pH is an excellent indicator parameter that helps when interpreting field observations, particularly if stress in the plants is evident.

Based on the rationale summarized above, Atlantic Richfield will conduct the following RTS scope of work for the 2017 field season, which is also summarized in Table 1.

- ☐ Soil sampling will be conducted in the amended revegetation plots using a similar sampling format as implemented during the 2016 field season. Each revegetation plot will be sampled in four quadrants (two per subplot). Two composite samples will be collected per quadrant at each depth interval. Samples will be collected at four, 1-foot depth intervals from 1-4 feet bgs. Each sample will consist of two randomly located soil borings within a quadrant composited to create one sample for each respective depth. A total of 48 composite samples will be collected, 16 in each of the three revegetation plots, with no sampling occurring in the control subplot.
- ☐ Additional sampling may be conducted in underperforming growth areas based on field observations.
- ☐ The samples will be submitted to A&L Western Laboratories in Modesto, California for pH analysis following the same protocol (saturated paste) as previous analyses.

REPORTING

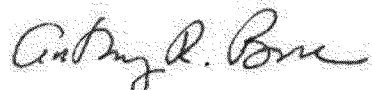
Data collected during the implementation of the previously approved RTS work plan during the 2016 season will be evaluated and incorporated into the Focused Feasibility Study Revegetation Treatability Study Report planned for submittal by the end of 2018. Data collected during the 2017 field season will be compared to the 2016 data and incorporated into the report, along with data collected in 2018.

SCHEDULE

Atlantic Richfield intends to conduct the field sampling in August 2017.

If U.S. EPA has any concerns with the supplemental soil sampling discussed in this letter, please provide written comments no later than August 10, 2017, so that the work schedule is not delayed.

Sincerely,



Anthony R. Brown
Project Manager, Mining

Lynda Deschambault
U.S. Environmental Protection Agency, Region 9
July 19, 2017
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Attachments: Table 1 – Revegetation Plots Supplemental Soil Sampling Requirements
Figure 1 – Revegetation Plots 1 and 2
Figure 2 – Hydrology Plots 1 and 2
Figure 3 – Revegetation Plot 3
Figure 4 – Hydrology Plot 3

cc: Gary Riley, U.S. Environmental Protection Agency, Region 9 – via electronic copy
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Dave McCarthy, Copper Environmental Consulting – via electronic copy
Cory Koger, U.S. Army Corps of Engineers – via electronic copy
Greg Reller, Burleson Consulting – via electronic copy
Ken Maas, U.S. Forest Service, Humboldt-Toiyabe National Forest – via electronic and
hard copy
Neil Mortimer, Washoe Tribe of California and Nevada – via electronic and hard copy
Norman Harry, Washoe Tribe of California and Nevada – via electronic and hard copy
Fred Kirschner, AESE, Inc. – via electronic and hard copy

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Supplemental pH Sampling Plan.docx



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TABLE 1
REVEGETATION PLOTS SUPPLEMENTAL SOIL SAMPLING REQUIREMENTS
Leviathan Mine Site
Alpine County, California

Analysis				Soil pH
Sampling Event				Summer 2017
Method				NAPT (Saturated Paste)
Container				1 gallon ziptop bag
Minimum Quantity				500g
Preservative ¹				None
Holding Time				7 d
Laboratory				A&L
Plot	Subplot	Location ID ²	Depth (bgs)	
R1	A	R1-A1	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
		R1-A2	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
	B	R1-B1	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
		R1-B2	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
R2	A	R2-A1	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
		R2-A2	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
	B	R2-B1	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
		R2-B2	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
R3	A	R3-A1	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
		R3-A2	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
	B	R3-B1	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
		R3-B2	0-1 ft	X
			1-2 ft	X
			2-3 ft	X
			3-4 ft	X
Estimated Number of Samples ³				48

- Note(s)
- 1. All samples shipped/stored on an as-is basis.
 - 2. Each location consists of two randomly located soil borings in each quadrant to make one composite for each respective depth.
 - 3. Sample quantities and locations may be adjusted by field personnel based on actual field conditions.
 - 4. MS/MSD or LD not applicable to soil physical or agronomic property testing.

Abbreviation(s)

A&L = A&L Western Laboratories in Modesto, California

ft = foot

bgs = below ground surface

g = gram

d = day

ID = identification

NAPT = North American Proficiency Testing Program (Soil Science Society of America)



Explanation — Study Area Boundaries □ Plot Boundary		REVEGETATION PLOTS 1 AND 2 Leviathan Mine Site Alpine County, California		 Figure 1
		By: dpv Date: 06/23/2017	Project No. 0013091	



Explanation <div><div></div> Study Area Boundaries <div></div> Plot Boundary</div>	<div><div></div><div>N</div><div>0150</div><div>Feet</div></div>	HYDROLOGY PLOTS 1 AND 2 Leviathan Mine Site Alpine County, California		<div><div></div><div>amec foster wheeler</div></div> <div>Figure 2</div>
		<div>By: dpv Date: 06/23/2017</div>	<div>Project No. 0013091</div>	



<p>Explanation</p> <p>— Study Area Boundaries</p> <p>□ Plot Boundary</p> <div></div>	<p>REVEGETATION PLOT 3 Leviathan Mine Site Alpine County, California</p> <table border="1"><tr><td>By: dpv</td><td rowspan="2">Project No. 0013091</td></tr><tr><td>Date: 06/23/2017</td></tr></table>	By: dpv	Project No. 0013091	Date: 06/23/2017	<div></div> <div><p>Figure 3</p></div>
By: dpv	Project No. 0013091				
Date: 06/23/2017					



<p>Explanation</p> <p>— Study Area Boundaries</p> <p>□ Plot Boundary</p> <div></div>	<p>HYDROLOGY PLOT 3 Leviathan Mine Site Alpine County, California</p> <table border="1"><tr><td>By: dpv</td><td rowspan="2">Project No. 0013091</td></tr><tr><td>Date: 06/23/2017</td></tr></table>	By: dpv	Project No. 0013091	Date: 06/23/2017	<div></div> <p>Figure 4</p>
By: dpv	Project No. 0013091				
Date: 06/23/2017					